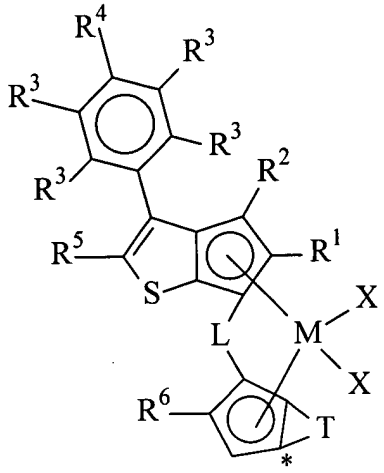
AMENDMENTS TO THE CLAIMS

1. (previously presented) A process for producing a polymer of ethylene containing from 0.1 to 99 % by mol of at least one derived unit of alpha-olefins of formula CH_2=CHZ, wherein Z is a C_2-C_{20} alkyl radical, and optionally from 0 to 5% by mol polyene, comprising contacting, under polymerization conditions, ethylene, at least one alph-olefin and optionally said polyene, in the presence of a catalyst system obtained by contacting:
a) a metallocene compound of formula (I):



(I)

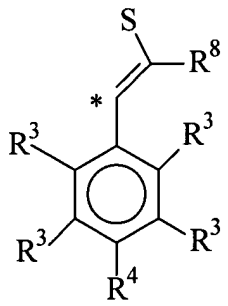
wherein
M is zirconium, hafnium or titanium;
X, equal to or different from each other, is a hydrogen atom, a halogen atom, an R, OR, OR'O, OSO_2CF_3, OCOR, SR, NR_2 or PR_2 group, wherein R is a linear or branched, saturated or unsaturated C_1-C_{20}-alkyl, C_3-C_{20}-cycloalkyl, C_6-C_{20}-aryl, C_7-C_{20}-alkylaryl, or C_7-C_{20}-arylalkyl radical, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements; and the R' substituent is a divalent group selected from C_1-C_{40}-alkylidene, C_6-C_{40}-arylidene, C_7-C_{40}-alkylarylidene or C_7-C_{40}-arylalkylidene radicals; two X can join to form a C_4-C_{40} dienyl ligand;
R^1 is a linear or branched, saturated or unsaturated C_1-C_{20}-alkyl, C_3-C_{20}-cycloalkyl, C_6-C_{20}-aryl, C_7-C_{20}-alkylaryl, or C_7-C_{20}-arylalkyl radical, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements;

R^2, R^3, R^4 and R^5, equal to or different from each other, are hydrogen atoms, halogen atoms or linear or branched, saturated or unsaturated C_1-C_{20}-alkyl, C_3-C_{20}-cycloalkyl, C_6-C_{20}-aryl, C_7-C_{20}-alkylaryl, or C_7-C_{20}-arylalkyl radicals, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements;

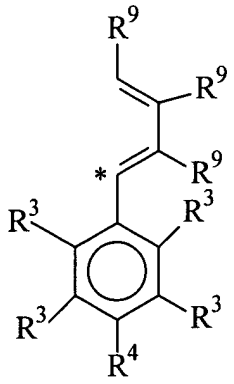
R^6 is a linear or branched, saturated or unsaturated C_1-C_{20}-alkyl, C_3-C_{20}-cycloalkyl, C_6-C_{20}-aryl, C_7-C_{20}-alkylaryl, or C_7-C_{20}-arylalkyl radical, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements;

L is a divalent bridging group selected from C_1-C_{20} alkylidene, C_3-C_{20} cycloalkylidene, C_6-C_{20} arylidene, C_7-C_{20} alkylarylidene, or C_7-C_{20} arylalkylidene radicals, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements, or a silylidene radical containing up to 5 silicon atoms;

T is a divalent radical of formula (II) or (III):



(II)



(III)

wherein

the atom marked with the symbol * is linked to the atom marked with the same symbol in the compound of formula (I);

R^8 is a hydrogen atom or a linear or branched, saturated or unsaturated C_1-C_{20}-alkyl, C_3-C_{20}-cycloalkyl, C_6-C_{20}-aryl, C_7-C_{20}-alkylaryl, or C_7-C_{20}-arylalkyl radical, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements;

R^9, equal to or different from each other, is a hydrogen atom or a linear or branched, saturated or unsaturated C_1-C_{20}-alkyl, C_3-C_{20}-cycloalkyl, C_6-C_{20}-aryl, C_7-C_{20}-alkylaryl, or C_7-C_{20}-arylalkyl radical, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements; and

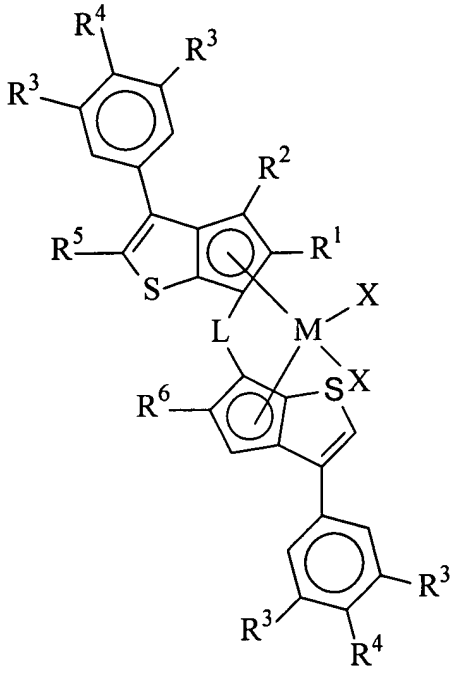
b) an alumoxane or a compound that forms an alkyl metallocene cation.

2. (original) The process according to claim 1 wherein the catalyst system further comprises an organo aluminum compound.

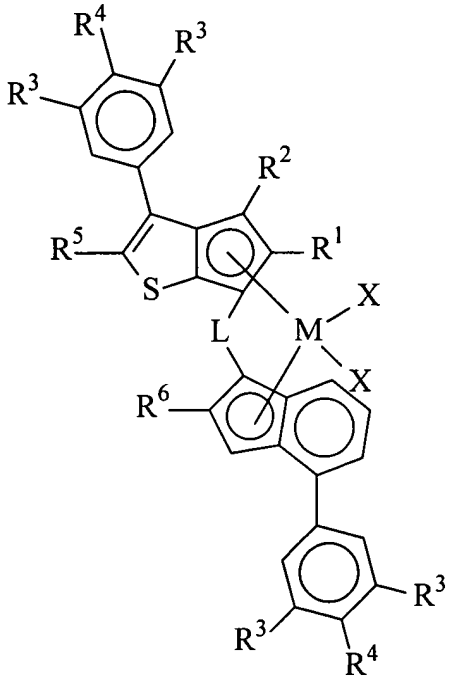
3. (previously presented) The process according to claim 1 wherein in the compound of formula (I),

X is a halogen atom, an R, OR'O or OR group; R^1 is a linear or branched, saturated or unsaturated C_1-C_{20}-alkyl radical; R^2 is a hydrogen atom; R^3 is a hydrogen atom or a linear or branched, saturated or unsaturated C_1-C_{20}-alkyl radical optionally containing at least one halogen atom; R^4 is a hydrogen atom or a linear or branched, saturated or unsaturated C_1-C_{20}-alkyl radical; R^6 is a linear or branched, saturated or unsaturated C_1-C_{20}-alkyl radical; L is $Si(CH_3)_2$, $SiPh_2$, SiPhMe, $SiMe(SiMe_3)$, CH_2, $(CH_2)_2$, $(CH_2)_3$, $C(CH_3)_2$, $C(Ph)_2$ or $C(CH_3)(Ph)$; R^8 is hydrogen or a linear or branched, saturated or unsaturated C_1-C_{20}-alkyl radical; and R^9 is hydrogen or a linear or branched, saturated or unsaturated C_1-C_{20}-alkyl radical.

4. (previously presented) The process according to claim 1 wherein the metallocene compound has formula (IV) or (V):



(IV)



(V)

wherein

R^3 is a hydrogen atom or a linear or branched, saturated or unsaturated C_1-C_{10}-alkyl radical, optionally containing at least one halogen atom; R^4 is a hydrogen atom or a linear or branched, saturated or unsaturated C_1-C_{10}-alkyl radical.

5. (original) The process according to claim 4 wherein, in the compounds of formula (IV) and (V), R^3 is a hydrogen atom or a group $-C(R^7)_3$, wherein R^7, equal to or different from each other, is a linear or branched, saturated or unsaturated C_1-C_8-alkyl radical; and R^4 is hydrogen or a group $-C(R^7)_3$.

6. (previously presented) The process according to claim 1 wherein, in the compounds of formula (I), R^3 and R^4 are hydrogen atoms.

7. (previously presented) The process according to claim 1 wherein, in the compounds of formula (I), when R^3 is an hydrogen atom, R^4 is a linear or branched, saturated or unsaturated C_1-C_{10}-alkyl radical, optionally containing at least one halogen atom; or when R^3 is a linear or branched, saturated or unsaturated C_1-C_{10}-alkyl radical optionally containing at least one halogen atom, R^4 is an hydrogen atom.

8. (previously presented) The process according to claim 1 wherein the catalyst system is supported on an inert carrier.

9. (previously presented) The process according to claim 8 wherein the inert carrier is a polyolefin.

10. (previously presented) The process according to claim 1 wherein the process is carried out in gas phase.

11. (previously presented) The process according to claim 1 wherein the alpha-olefin is 1-pentene, 1-hexene or 1-octene.

12. (previously presented) The process according to claim 4 wherein, in the compounds of formulas (IV) and (V), R^3 and R^4 are hydrogen atoms.

13. (previously presented) The process according to claim 4 wherein, in the compounds of formulas (IV) and (V), when R^3 is an hydrogen atom, R^4 is a linear or branched, saturated or unsaturated C_1-C_{10}-alkyl radical, optionally containing at least one halogen atom; or when R^3 is a linear or branched, saturated or unsaturated C_1-C_{10}-alkyl radical optionally containing at least one halogen atom, R^4 is an hydrogen atom.